ATTACHMENT 1
Background and Responsibilities

I. BACKGROUND

1. Molds can be found almost everywhere. Mold grows rapidly (biomagnification) indoors when the spores come in contact with building materials that have sufficient moisture to support active fungal growth. The typical conditions leading to mold growth in buildings include inadequate moisture control, deficient ventilation systems, poor housekeeping, chronic water intrusion, and/or isolated floods, such as from a burst water pipe. Once growth begins, fungal spores and bacteria amplify quickly. The microorganisms produce new spores that are introduced into the airstream either because the mold grows on the wet building material or during other building material disturbances (e.g., renovations, repair work, etc.). Such growth also can lead to the release of volatile compounds and odors characteristic of fungal/microbial growth.

2. Preventing and remediating water damage is necessary to protect the health and well being of AF communities and our investment in AF infrastructure. ***In most cases, mold-related contamination is associated with water--the key to an effective mold program is controlling moisture in the facility. However, moisture control must be combined with adequate housekeeping and active participation of facility occupants in inspecting and responding promptly to initial signs of mold. By promoting timely facility moisture control, effective housekeeping, and active occupant participation, installations can successfully control mold growth and prevent potential subsequent medical concerns.***

II. RESPONSIBILITIES

1. This policy covers both facility (e.g., administrative, industrial, dormitories, child development centers, and family housing) and management issues related to water damage including: prevention, evaluation, control, and disposal of water damaged and mold-contaminated building materials. The organizations and personnel with primary responsibilities are discussed below. Risk communication should be considered a critical element in any water damage or mold remediation project.

2. Building Managers. Using the guidance in Attachment 2 (Mold Prevention Tips for Facility Managers), inspect and report moisture problems before mold and related microbial contamination becomes problematic. Since molds depend on the availability of nutrients (e.g. dirt, cellulose, and other substrates) as well as moisture, ensure a clean and dry environment is maintained within the facility. As part of routine building inspections required by AFPAM 32-1004 Volume 3, *Working in the Operations Flight Facility Maintenance* (1 September 1998), conduct periodic evaluations of the facility:

- Heating, Ventilation, and Air Conditioning (HVAC) system(s)
- Pipe chases
- Utility tunnels
- Building “envelope” (roof, walls, flooring, etc.)

(a) A facility that has a history of water damage or HVAC problems may initially be placed on a 30-day evaluation cycle and later, as maintenance requirements subside, the cycle

may extended. Building managers (with necessary HVAC support personnel) must perform the following actions during scheduled facility visits:

(1) Monitor the facility for signs of water damage (e.g., spotted ceiling tiles, water marks near windows/doors/damp floors, etc)
(2) Check for signs of condensation and/or suspected mold growth around diffusers or HVAC vents
(3) Verify HVAC condensate drain pans are functioning properly
1. (4) Confirm that HVAC is operating within design criteria
2. (5) Confirm that the building's thermostat is maintained at the installation's recommended temperature

(b) Building managers must clean and correct any small mold problems or water damage within their capability (such as replacing ceiling tiles with minor water damage after ensuring Civil Engineering (CE) has fixed the roof leak and caulking foundation cracks) promptly (within 48 hours) following the guidelines in Attachment 3. If mold contamination or water damage exceeds the building manager's abilities, the manager will contact the CE Customer Service Center to request an AF Form 332 work order:

(1) The initial work order should be classified as an **emergency** work order for CE to respond to the facility to identify and mitigate the moisture problem and dry or remove water damaged building materials. This initial work order is an "emergency" because water can cause electrical shock and deteriorate building materials beyond normal "safe" conditions, potentially leading to dangerous structural failures (i.e., roof collapse, etc.). After the initial response, CE may downgrade the work order to "urgent" status.
(2) All follow-on actions must be completed as an **urgent** work order. CE will replace damaged building materials and remediate mold contamination from the affected area within five workdays after receipt of necessary building materials. When a water leak penetrates walls, ceilings, foundation cracks, etc., it **should not** be downgraded to a routine work order. The water problem must be corrected before mold is allowed to develop.

(c) Before accomplishing a mold or water damage remediation project, the building manager, in coordination with the Bioenvironmental Engineering (BE), and CE, shall notify the building occupants and the building's organizational commander in the affected area(s). While small-scale projects do not dictate "whole building" notifications, coordinate activities with the supervisors of the affected areas. Supervisors are then responsible for notifying affected personnel. Notification must include a description of the planned remedial measures and an estimated completion date. Notification should also include points of contact for any occupant health concerns.

(d) If a building manager receives occupant health complaints, he/she should refer the potentially affected personnel to their medical provider (section "4").

3. Civil Engineering (CE). The installation CE will evaluate mold contamination complaints and adequately resource all aspects of remediation activities to control and prevent infrastructure deterioration from mold.

(a) CE Operations (CEO): Conduct facility evaluations (upon building manager request) in dormitories, family housing, lodging, industrial, and administrative buildings following the facility inspection guidelines in AFIERA Technical Report, Guide for Indoor Air Quality Surveys, IERA-RS-BR-TR-2003-0001 or in subsequent technical report updates. Rely on visual inspection and, where appropriate, humidity sensors, to identify obvious growth or persistent water problems. In facilities where mold and/or moisture/excess humidity problems are present (reference Atch 2), CEO should determine the source. CE may request the BE assist with the facility evaluation as required (Atch 6, Reference "a" contains facility evaluation guidelines).

(1) Control sources of moisture through proper management, isolation and containment; once mold and microbial contamination is identified, remediate water damaged areas. The accumulation of dirt on ventilation system surfaces tends to dry slowly after condensation has occurred, produces an increased surface area for microbial growth, and provides nutrient material for the microorganisms. Any time visual inspection indicates mold growth on the thermal/acoustic lining in the duct or air handler, recommend the contaminated lining material be replaced. Cleaning of contaminated lining material is not recommended due to the difficulty of cleaning the porous material without causing damage. If mold growth is extensive through out the HVAC system, consider replacing all the lining in the contaminated system. If the duct is metal with the thermal/acoustic material on the exterior, then clean the duct interior using procedures for non-porous surfaces. Take care to avoid leakage of cleaning solutions and to ensure ducts are dried before returning to service.

(2) Mold-related or water damage service calls to CE should be addressed as discussed on page 2 of this attachment. CE will coordinate with the building manager and complete necessary facility alterations or repairs to remediate the mold problem or water damage. CEO will complete **emergency** work orders and **urgent** work orders in accordance with the timeframes listed in AFPAM 32-1004 Volume 3, *Working in the Operations Flight Facility Maintenance* (1 Sept 1998). CE craftsmen and contractors must use the guidance outlined in Attachments 3 and 4 to remove water damaged building materials and remediate facilities contaminated with mold.

(3) Water damaged building materials must be repaired/removed in accordance with Attachment 3 and Table 3.1. These guidelines are designed to help avoid the need for remediation of mold re-growth by taking quick action before growth starts. However, once mold becomes established in a facility, clean, repair, or remove mold contaminated building materials following guidelines described in Attachment 4 and Table 4.1.

(4) During cleaning, repair and removal operations, workers will wear the appropriate BE-approved personal protective equipment (PPE). CEO will incorporate mold

awareness and preventative issues into the Building Managers Handbook and Facility Managers program.

b. Civil Engineering Housing (CEH): Housing managers will initially investigate occupant complaints to screen out complaints associated with invasive mold/water problems due to poor housekeeping. If mold-related contamination or water damage exceeds the housing manager's abilities, the manager will contact the CE Customer Service Center to request an AF Form 332 work order:

- The initial work order should be classified as an **emergency** work order for CE to respond to the facility to identify and eliminate the moisture problem and dry or remove water damaged building materials. This initial work order is an "emergency" because water can cause electrical shock and deteriorate building materials beyond normal "safe" conditions, potentially leading to dangerous structural failures (i.e., roof collapse, etc.). After the initial response, CE may downgrade the work order to "urgent" status.
- All follow-on actions must be completed as an **urgent** work order. CE will replace damaged building materials and remediate mold contamination from the affected area within five workdays after receipt of necessary building materials. When a water leak penetrates walls, ceilings, foundation cracks, etc., it **should not** be downgraded to a routine work order. The water problem must be corrected before mold is allowed to develop.

(1) If a housing manager receives occupant health complaints, he/she should refer the potentially affected personnel to their medical provider (section "4").

(2) Housing managers located in climates susceptible to mold are encouraged to make occupants aware of mold issues and common prevention measures (Atch 2). Housing managers will distribute copies of the EPA Mold Guide (Atch 6, reference "f") to all incoming military family housing occupants when required by the installation CE. The decision to distribute the guide should be based on the installation's location and climate (i.e., is the installation located in a "humid area"). Humid areas are defined by UFC 3-400-2, Design Engineering Weather Data, as:

- Areas having over 3000 hours of 67 degrees Fahrenheit or higher wet bulb temperature

OR

- Areas with over 1500 hours of 73 degrees Fahrenheit or higher wet bulb temperature.

(3) In all cases, <u>if</u> the mold guide is provided, installations must require the occupants to acknowledge receipt.

c. Civil Engineering Environmental (CEV): Environmental Flights will support CEO and CEH during water damage and mold related remediation projects. The CEV will coordinate remediation work with the responsible state or local agency and provide necessary regulatory or

public notification when required by state/local laws or regulations. Incorporate this policy into the "Commander's Guide to Installation Excellence."

- d. Civil Engineering Construction (CEC): Mold prevention should start in facility design to reduce, to the greatest extent possible, the conditions that lead to mold growth and mold-related microbial contamination. CEC will design new construction and renovation projects in accordance with Engineering Technical Letter (ETL) 04-3: *Design Criteria for prevention of Mold In Air Force Facilities*.

4. Medical Treatment Facility Staff: Provide health risk assessments and appropriate care to personnel that work or reside in AF facilities.

(a) MTF Commander: The MTF commander will provide personnel and expertise to evaluate occupant building related health complaints (These complaints may or may not be due to the indoor environment within a building but because of health concerns require medical and occupational health personnel evaluation).

(b) Physicians: Will provide medical evaluation and appropriate care to personnel with health complaints that may be building (including mold) related. In addition physicians will work with other members of Team Aerospace when requested to evaluate facilities for potential building (including mold) related illnesses. Military members seeking initial medical care for suspected building related illnesses or nonspecific indoor-related symptom complaints will notify their supervisor and schedule an appointment with their primary care provider. If the medical provider believes the symptoms are related to the building, then they should send an AF Form 190, *OccupationalIillness/Injury Report*, or SF-513, *Medical Record - Consultation Sheet* through PH. Civilian members seeking initial medical care for suspected building related illnesses or nonspecific indoor-related symptom complaints will notify their supervisor and should then seek medical care from their primary care provider. If after consulting with their medical provider the provider believes the symptoms are related to the building, then they should contact civilian personnel for completion of a US Department of Labor CA-2 *Notice of Occupational Disease and Claim for Compensation*.

(c) Bioenvironmental Engineering (BE). BE will work with CE staff to apply Operational Risk Management (ORM) principles in conducting health risk assessments to investigate/identify potential causes of building-related illness. BE will work with other Team Aerospace members to determine the need for and in the completion of health risk assessments in response to physician identified illness that may be building related. When remediation of mold-damaged areas is required, BE will recommend appropriate PPE, review/validate the remediation plan, and coordinate with CE in accordance with Attachment 4. If remediation is conducted, BE will work with CE to evaluate and visually verify the facility is suitable for re-occupancy.

(1) Mold sampling should only be accomplished as the result of consultation with the physician/health care provider and an occupational medicine physician or allergist in order to provide information that supports a specific clinical diagnosis or aids in medical treatment.

(2) If sampling is required, BE will perform sampling in accordance with guidance found in AFIERA Technical Report, Guide for Indoor Air Quality Surveys, IERA-RS-BR-TR-2003-0001 (Feb 2003), or subsequent updates.

(3) Microbial sampling and analysis has significant limitations and may not be a predictor of indoor air related health problems. There are currently no industry or legal standards for acceptable microbial concentrations in buildings.

(d) Public Health (PH): PH will evaluate clusters of occupationally linked illnesses or clusters of potential mold-related illness in AF buildings as identified through the AF Form 190, SF 513, and CA-2.

5. Facility Occupants. It is impossible to get rid of all mold and mold spores indoors; some mold spores will be found floating through the air and in house dust. The mold spores will not grow if moisture is not present. Indoor mold growth can and should be prevented or controlled by controlling moisture indoors.

(a) Base Housing. Places that are often or always damp can be hard to maintain completely free of mold. If there's some mold in the shower or elsewhere in the bathroom that seems to reappear, increase the air circulation by leaving the shower door/curtain open along with the door to the bathroom. Also, clean more frequently and this will usually prevent mold from recurring, or at least keep the mold to a minimum. Practice sound housekeeping: vacuum floors, remove trash frequently, prevent excessive dust accumulation, and use typical household cleaning products to control mold and mildew. When water leaks or spills occur indoors - ACT QUICKLY. If wet or damp materials or areas are dried 24-48 hours after a leak or spill happens, in most cases mold will not grow. Report all plumbing/building leaks and moisture problems immediately to your housing manager. Occupants should:

- Clean and repair roof gutters regularly.
- Make sure the ground slopes away from the house foundation, so that water does not enter or collect around the foundation. Report any identified problems to housing for resolution.
- Keep air-conditioning drip pans clean and the drain lines unobstructed and flowing properly.
- To help reduce moisture buildup in the home, when cooking, always operate the stove exhaust hood or when bathing, use the bathroom exhaust fan. Make sure the laundry clothes dryer vent is connected properly and exhausting outdoors.
- If you see condensation or moisture collecting on windows, walls or pipes - ACT QUICKLY to dry the wet surface and reduce the moisture/water source. Condensation can be a sign of high humidity.

(b) All Other Installation Facilities. Report signs of condensation and wet spots on building materials to Facility Manager. Practice sound housekeeping practices in work areas to

include vacuum floors, remove trash frequently, and prevent excessive dust accumulation. When water leaks or spills occur indoors - ACT QUICKLY. If wet or damp materials or areas are dried 24-48 hours after a leak or spill happens, in most cases mold will not grow. Report all plumbing/building leaks and moisture problems immediately to your Facility Manager.

6. Flow Chart to Help Installations Respond to Mold/Water Damage. Installations are encouraged to use the attached flow chart to address water damage and mold contamination in their facilities. Consult Attachment 5 for basic mold program management guidelines.

III. FUNDING

1. Funding for mold remediation (including emergency actions and temporary relocation of facility occupants) shall be programmed through appropriations intended for the type of work being accomplished (e.g. Transportation Working Capital Funds, Military Construction, Operation & Maintenance, Military Family Housing, Defense Health Program (DHP), etc.) consistent with programming rules specified in AFIs applicable to facilities work. Typical mold abatement projects would, in most cases, be accomplished as part of a larger facility project.

2. Funding for mold sampling, analysis, and monitoring costs completed to support a medical assessment, as directed by the chief of flight/occupational medicine, shall be programmed through the DHP. Where appropriate, a Risk Assessment Code (RAC) will be entered into the installation Hazard Abatement Plan, in accordance with AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program.*